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Notes on the orchid flora of Mount Kinabalu, Borneo

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Summary. A supplement to the treatment of the Orchids of Mount Kinabalu (Wood *et al.*, 1993) is presented below. Included are references to 14 recently described taxa, 21 new records, and 5 taxa that have been reduced to synonymy or have undergone name changes. Our current estimate of the number of orchid taxa on Mount Kinabalu is 745; however, more accurate figures await taxonomic revisions of several problematic genera.

The following notice appeared in *The Orchid Review* (Vol. 3, no. 36: 356) for December 1895:—

> "Orchid Collecting in British North Borneo. The following proclamation is taken from the Official Gazette, British North Borneo, for August 1st. 1895:—Orchid Collecting.—No permit to travel for the collection of orchids in Province Keppel and the District of Kinabalu is to be issued until further orders. Any person travelling or collecting orchids without a permit is liable to a penalty of 500 dols., or to imprisonment under Proclamation VII of 1890. Sandakan, July 9th, 1895."

Although these words are as relevant today as they were 100 years ago, controlled collecting for scientific and ethnobotanical purposes continues in the environs of Mount Kinabalu. An extensive collecting programme is currently underway through *Projek Etnobotani Kinabalu* (PEK). This project, initiated in 1992, aims to link ethnobotanical research with conservation action by strengthening: 1)the link between Kinabalu Park and local communities; 2) interpretive programmes that reach most of the 200,000 visitors who come to the Park each year; 3) the scientific infrastructure available in the Natural History Museum of the Park; 4) the ability of local Dusun people to use botanical resources in a sustainable way; and 5) the assessment of the sustainability and value of plant resources in and around the Park. The PEK

collections have resulted in the addition of 13 of the 35 new orchid records for Mount Kinabalu reported here.

A team of 12 local people have been incorporated into the project as ethnobotanical collectors. Thus far they have obtained nearly 7000 herbarium specimens that have been submitted to the Royal Botanic Gardens, Kew, for identification. All of the monocotyledons, amounting to about 750 specimens, are already identified, and these include 127 orchid collections. The PEK collections have resulted in a dramatic increase in the known flora of Mount Kinabalu, including the addition of eight families, nearly 50 genera and about 150 species to the monocotyledons previously unrecorded from the mountain.

Wood *et al.* (1993) listed some 711 orchid taxa in 121 genera from Mount Kinabalu (4095 m), the highest mountain in Southeast Asia. Of these taxa, 596 were fully named, seven were questionably identified and a hundred more were incompletely identified. Since publication of the enumeration, 14 new taxa have been described, most of the types of which have been collected on Mount Kinabalu. Several additional taxa have also been recently recorded from the mountain and other information has been gathered.

For the purposes of this paper, we included all the area within Kinabalu Park and various adjacent *kampung* (villages) as parts of Mount Kinabalu. As such, Mount Tambuyukon, the third highest peak in Sabah, is included as part of this region. Mount Kinabalu and Tambuyukon are separated by less than 5 km with several mountain ridges more or less connecting them and therefore we feel justified in treating the two as a single area. We have maintained the format of the orchid checklist published by Wood *et al.* (1993) because this compilation is intended to serve as a supplement to that treatment.

RECENTLY DESCRIBED TAXA

BROMHEADIA Lindl.

1. Bromheadia cecieliae Kruizinga in *Orch. Monographs* 8: 101, fig. 39 (1997). Type: Borneo, *de Vogel* s.n., Leiden cult. no. 913892 (holotype L).

Epiphyte. Lower montane forest. Elevation: 1400 m. Flowering observed in February, July, November, to December.

Endemic to Mount Kinabalu.

Collection: Mount Kinabalu, Gurulau Spur, *Carr* SFN 27455 p.p. (SING).

2. Bromheadia lohaniensis Kruizinga & de Vogel in *Orch. Monographs* 8: 108, fig. 48 (1997). Type: Sabah, Mount Kinabalu, Lohan River, *Vermeulen* s.n., Leiden cult. no. 26690 (holotype L).

Epiphyte. Hill forest on ultramafic substrate. Elevation: 600 m. Flowering time not recorded.

Endemic to Mount Kinabalu.

Known only from the type.

3. Bromheadia longifolia Kruizinga & de Vogel in *Orch. Monographs* 8: 109, fig. 49 (1997). Type: Sabah, Keningau, Trus Madi Forest Reserve, *Leopold et al.* SAN 71909 (holotype & isotype K).

Epiphyte. Lower montane forest. Elevation: 1400 m. Flowering time not recorded.

General Distribution: Borneo.

Collection: Mount Kinabalu, Gurulau Spur, *Carr* SFN 27455 p.p. (SING).

BULBOPHYLLUM Thouars

4. Bulbophyllum anaclastum J.J. Verm. in *Blumea* 38, 1: 149, fig. 5 (1993). Type: Sabah, Mount Kinabalu, *Carr* SFN 27902 (holotype L; isotypes AMES, LAE, SING). Section *Sestochilus*.

Epiphyte. Primary forest. Elevation: 1700–1900 m. Flowering observed in June and August.

Endemic to Mount Kinabalu.

Additional collections: Mount Kinabalu, *Aban* SAN 76693 (K, SAN); *J. & M.S. Clemens* 29821 (BM). Cited under *B. uniflorum* (Blume) Hassk. by Wood *et al.* (1993).

5. Bulbophyllum cerebellum J.J. Verm. in *Blumea* 41, 2: 350, fig. 7 (1996). Type: Sabah, without precise locality, *Giles* 998 (holotype K). Section *Hirtula*.

Epiphyte. Primary forest. Elevation: 1300 m. Flowering observed in May.

Probably not endemic to Mount Kinabalu. The collector of the type, Cyril Giles, was a rubber planter based at the Sapong Estate near Tenom, who made collections in the foothills of the Crocker Range behind the estate during the 1960's.

Collection: Mount Kinabalu, *Carr* C.3470 (AMES).

6. Bulbophyllum dibothron J.J. Verm. & A. Lamb in *Blumea* 38, 2: 344, fig. 8 (1994). Type: Sabah, Crocker Range, near Tambunan, *Jongejan* cult. no. 1956 (holotype L). Section *Monilibulbus*.

Epiphyte on tree trunks and branches. Montane forest. Elevation: 1500–2000 m. Flowering observed in January.

Additional collections: Crocker Range, near Tambunan, *Lamb* AL 1294/91 (L); Mount Kinabalu, *Vermeulen, van Welzen & Lamb* 1330 (L).

7. Bulbophyllum hemiprionotum J.J. Verm & A. Lamb in *Blumea* 38, 2: 343, fig. 7 (1994). Type: Sabah, Mount Kinabalu, *Vermeulen* 467 (holotype L). Section uncertain.

Epiphyte on trunks and branches near the forest floor. Mixed high forest, and low and open forest with many rattans. Elevation: 1700–2000 m. Flowering observed in January, March, July, September and October.

Additional collections: Mount Kinabalu, *J. & M.S. Clemens* 34107 (BO, E, NY); *Lamb* AL 743/87 (L); *Vermeulen, van Welzen & Lamb* 1329 (L). Sabah, Sipitang District, Ulu Padas, near Sarawak border, *Vermeulen* 613 (L).

CALANTHE R.Br.

8. Calanthe otuhanica C.L. Chan & T.J. Barkman in *Sandakania* 9: 29, fig. 1 (1997). Type: Sabah, Mount Kinabalu, Kinabalu Lipson, 15 July 1994, *Barkman* TJB 27 (holotype SAN; isotypes K, Sabah Parks Herbarium, SING, Universiti Malaysia Sarawak Herbarium).

Terrestrial. Steep, open, well-drained areas on recent or established stabilised landslides on ultramafic substrates. Elevation: 2550–2990 m. Flowering observed in January and July.

Endemic to Mount Kinabalu.

Collection: Mount Kinabalu, Lipson area, *Barkman* TJB 60 (Sabah Parks Herbarium, Kinabalu Park, SAN).

CYMBIDIUM Sw.

9. Cymbidium kinabaluense K.M. Wong & C.L. Chan in *Sandakania* 2: 86, figs. 1 & 2 (1993). Type: Sabah, Mount Kinabalu, 20 January 1993, *Chan & Nais* s.n. (holotype SAN; isotype SNP).

Epiphyte in moss cushions near the ground. Montane forest. Elevation: 1700 m. Flowering observed in January.

Endemic to Mount Kinabalu.

DENDROBIUM Sw.

10. Dendrobium cymboglossum J.J. Wood & A. Lamb in Wood & Cribb, *Checklist Orch. Borneo*: 247, fig. 29, plate 8C (1994). Type: Sabah, Sandakan, 29 April 1895, *Governor Creagh* s.n. (holotype K).

Epiphyte. Primary forest and thickets. Elevation: *c.* 400 m. Flowering observed in May and November.

General distribution: Borneo.

Additional collections: Mount Kinabalu, Kampung Nalumad, 700 m from Mekedeu River, 5 Nov. 1996, *Daim Andau* (PEK) 937 (K). Kota Marudu District, Kampung Monggis, 3.25 miles from centre of Kampung, *c.* 400 m, 13 May 1996, *Matamin Rumutom* (PEK) 251 (K).

11. Dendrobium lamrianum C.L. Chan in *Sandakania* 5: 69, figs. 1–3 (1994). Type: Sabah, Mount Kinabalu, Silau Silau Trail, 12 December 1993, *Sumbin & Gunsalam* SNP 5134 (holotype SAN; isotypes K, SNP). Section *Distichophyllum*.

Epiphyte. Montane forest. Elevation: 1700–1800 m. Flowering observed in November and December.

Endemic to Mount Kinabalu.

Additional collections: Mount Kinabalu, Kiau View Trail, *Lamb & Phillipps* AL 161/83 (K). Sight record: Mamut Orchid Centre, *Barkman* (colour slide), February, 1998.

DENDROCHILUM Blume

12. Dendrochilum cruciforme J.J. Wood in Wood & Cribb, *Checklist Orch. Borneo*: 169, fig. 24 A & B (1994). Type: Sabah, Mount Kinabalu, Peniguppan, January 1933, *J. & M.S. Clemens* s.n. (holotype K; isotypes AMES, BO, E, HBG, L). Section *Cruciformia*.

a. var. **cruciforme**

Epiphyte. Lower montane forest; *Leptospermum/Dacrydium* forest about 8 metres high on steep east facing slopes on weathered sandstone and shale. Elevation: 900–2000 m. Flowering observed in January, March, June, August, October, November and December.

Additional collections: Mount Kinabalu: Peniguppan, *J. & M.S. Clemens* 30471 (E), *J. & M.S. Clemens* 30826 (AMES, BM, E, K), *J. & M.S. Clemens* 32220 (BM, E), *J. & M.S. Clemens* 50322 (AMES, BM, K) & *J. & M.S. Clemens* s.n. (BM, E); Penataran Basin, *J. & M.S. Clemens* 40134 (AMES, BM, E); Tinekuk Falls, *J. & M.S. Clemens* 50278 (AMES, BM,

K); Marai Parai, *Collector unknown* SFN 36563 (SING). Sabah, Kota Kinabalu to Sinsuron road, Mile 27, from roadside stall, *Bacon* 187 (E). Sabah, Crocker Range, Mount Alab, south ridge, *de Vogel* 8661 (L).

b. var. **longicuspe** J.J. Wood in Wood & Cribb, *Checklist Orch. Borneo*: 170, fig. 24 C & D (1994). Type: Sabah, Mount Kinabalu, Kadamaian River, August 1933, *Carr* C. 3675, SFN 28004 (holotype K; isotype SING).

Epiphyte. Upper montane mossy forest. Elevation: 2000–2500 m. Flowering observed in May and August.

Endemic to Mount Kinabalu.

Collection: Mount Kinabalu, Summit Trail below Layang Layang, May 1995, *Barkman* TJB 194 (Sabah Parks Herbarium, Kinabalu Park).

13. Dendrochilum pseudoscriptum T.J. Barkman & J.J. Wood in *Orchid Rev.* 104 (1209): 1, figs. 91–93 (1996). Type: Sabah, Mount Kinabalu, near Kinabalu Lipson, 20 May 1995, *Barkman* TJB 198 (holotype Sabah Parks Herbarium, Kinabalu Park, isotype K). Section *Eurybrachium*.

Epiphyte. Upper montane *Dacrydium gibbsiae* and *Leptospermum recurvum* scrub forest on ultramafic substrate. Elevation: 2700–3000 m. Flowering observed in April and May.

Endemic to Mount Kinabalu.

Additional collections: Mount Kinabalu, Summit Trail above Layang Layang, *Barkman* TJB 16 & *Barkman* TJB 18 (Sabah Parks Herbarium, Kinabalu Park); northern ridge adjacent to Low's Gully, along trail leading to Melangkap Tomis, *Barkman* TJB 183 (Sabah Parks Herbarium, Kinabalu Park).

HAPALOCHILUS (Schltr.) Senghas

14. Hapalochilus lohokii (J.J. Verm & A. Lamb) Garay, Hamer & Siegerist in *Nord. J. Bot.* 14 (6): 643 (1994). Type: Sabah, *Lamb* AL 569/86 (holotype L).

Bulbophyllum lohokii J.J. Verm. & A. Lamb in *Blumea* 38: 339, fig. 4 (1994).

Epiphyte, usually on small branches near the forest floor. Upper montane forest; moss-covered *Dacrydium* in open, sunny situations. Elevation: 1700–2000 m. Flowering observed in March and from June to October.

Additional collections: Mount Kinabalu: Kamburongoh, *Carr* SFN 27564 (L, SING); Pinosuk Plateau, cult. Kinabalu Park Mountain Garden, *Lamb* AL 820/87 (K); *Phillipps* SNP

2393 (L); *Vermeulen & Chan* 398 (L). Sabah, Crocker Range, Mount Alab, *Lamb* SAN 92317 (K, drawing only, SAN); Mount Alab, south ridge leading to summit, *Vermeulen* 651 (K, L, UKMS).

NEW RECORDS FOR EARLIER DESCRIBED TAXA

ADENONCOS Blume

15. Adenoncos major Ridl. in *J. Linn. Soc., Bot.* 32: 350 (1896). Type: Peninsular Malaysia, Johore, Batu Pahat, Ridley s.n. (syntype SING); Pahang, Kota Glanggi, *Ridley* s.n. (syntype SING); Kedah, Kedah Peak, *Ridley* s.n. (syntype SING).

Epiphyte. Primary forest. Elevation: 600 m. Flowering observed in April.

General distribution: Peninsular Malaysia and Borneo.

Collection: Mount Kinabalu, Kampung Nalumad, 13 April 1995, *Daim Andau* (PEK) 35 (K).

16. Adenoncos parviflora Ridl. in *J. Linn. Soc., Bot.* 32: 350 (1896). Type: Peninsular Malaysia, Kuala Lumpur, *Kelsall* s.n. (holotype drawing by *Ridley* K).

Epiphyte. Primary forest. Elevation: *c.* 400 m. Flowering observed in August.

General distribution: Thailand, Peninsular Malaysia, Sumatra and Borneo.

Collection: Mount Kinabalu, Kampung Melangkap Tomis, on side of Penataran River, 10 Aug. 1996, *Lorence Lugas* (PEK) 2592 (K).

AGROSTOPHYLLUM Blume

17. Agrostophyllum elongatum (Ridl.) Schuit. in *Blumea* 35(1): 165 (1990). Type: Peninsular Malaysia, Tahan River, *Ridley* s.n. (holotype SING, isotype K).

Appendicula elongata Ridl. in *Trans. Linn. Soc. London*, Bot., ser. 2, 3: 375 (1893).

Epiphyte. Lower montane forest. Elevation: 1500 m. Flowering observed in September.

Collection: Mount Kinabalu, Tenompok, 1500 m, *J. & M.S. Clemens* 26774 (K).

APPENDICULA Blume

18. Appendicula pilosa J.J. Sm. in *Icon. Bogor.* 2: 53, t. 110A (1903). Type: Kalimantan, Sungai Tjehan, *Nieuwenhuis* s.n. (holotype BO).

Epiphyte. Habitat not recorded. Elevation: not recorded. Flowering observed in May.

General distribution: Borneo.

Collection: Mount Kinabalu, 3 km from Kampung Melangkap Tomis, 12 May 1996, *Lorence Lugas* (PEK) 2127 (K).

19. Appendicula reflexa Blume, *Bijdr.*: 301 (1825). Type: Java, Tjapus, Pantjar, *Blume* s.n. (holotype BO).

Epiphyte. Primary forest. Elevation: 1200 m. Flowering observed in April.

General distribution: S.E. Asia, eastwards to New Guinea and the Pacific islands.

Collection: Mount Kinabalu, Ranau District, Kampung Himbaan, Notoki, 14 April 1993, *Doinis Soibeh* (PEK) 205 (K).

20. Appendicula undulata Blume, *Bijdr.*: 301 (1825). Type: Java, Pantjar, *Blume* s.n. (holotype BO).

var. **undulata**

Epiphyte. Primary forest. Elevation: not recorded. Flowering observed in October.

General distribution: Peninsular Malaysia, Sumatra, Java and Borneo.

Collection: Mount Kinabalu, Kampung Nalumad, 4 miles from Nalumad, Park boundary, 1 Oct. 1996, *Daim Andau* (PEK) 758 (K).

BULBOPHYLLUM Thouars

21. Bulbophyllum polygaliflorum J.J. Wood in *Kew Bull.* 39 (1): 96, fig. 15 (1984). Type: Sarawak, Mount Mulu National Park, Camp 4, along path to camp, 18 March 1978, *Hansen* 499 (holotype C; isotype K). Section *Hirtula*.

Epiphyte. Lower montane forest. Elevation: 1600 m. Flowering observed in January.

General distribution: Borneo.

Collection: Mount Kinabalu, Liwagu River, along new trail to Mesilau resort, January 1996, *Barkman* TJB 276 (Sabah Parks Herbarium, Kinabalu Park).

COELOGYNE Lindl.

22. Coelogyne asperata Lindl. in *J. Hort. Soc. London* 4: 221 (1849). Type: Borneo, ex cult. *Twisden Hodges* (holotype K).

Terrestrial or epiphytic. Growing with *Leptaspis urceolata* (Graminae). Elevation: not recorded. Flowering observed in September.

Collection: Mount Kinabalu, Ranau District, 5.5 km from Kampung Takutan, 6 Sept. 1995, *Lomudin Tadong* (PEK) 540 (K).

CORYBAS Salisb.

23. Corybas piliferus J. Dransf. in *Kew Bull.* 41 (3): 588 (1986). Type: Sabah, Nabawan, *J. Dransfield* 5129 (holotype K).

General distribution: Borneo.

Record: Mount Kinabalu, Kiau View Trail, *c.* 1500 m, Sept. 1994, sight record and photograph by *J. Dransfield.*

Corybas piliferus J. Dransf. (Photo: J. Dransfield)

DENDROBIUM Sw.

24. Dendrobium lampongense J.J. Sm. in *Bull. Dép. Agric. Indes Néerl.*, 15: 14 (1908). Type: Sumatra, Lampong, *Brautigam* s.n. (holotype BO).

Epiphyte. Primary forest. Elevation: 400 m. Flowering observed in February.

General distribution: Sumatra and Borneo.

Collection: Mount Kinabalu, Kampung Melangkap Tomis, Peramat River towards Pisoh, 2 February 1996, *Lorence Lugas* (PEK) 1716 (K).

GASTRODIA R.Br.

25. Gastrodia javanica (Blume) Lindl., *Gen. Sp. Orch. Pl.*: 384 (1840). Type: Java, Seribu, *Blume* s.n. (holotype BO).

Epiphanes javanica Blume, *Bijdr.*: 421, fig. 4 (1825).

Saprophyte. Hill forest. Elevation: 500 m. Flowering observed in April.

General distribution: China?, Japan (Ryukyu Islands), Taiwan, Peninsular Malaysia, Thailand, Java, Philippines.

Collection: Mount Kinabalu, Ranau, Nalumad, along trail to Kebun Kasim, 30 April 1995, *Barkman* TJB 187 (Sabah Parks Herbarium, Kinabalu Park).

HYLOPHILA Lindl.

26. Hylophila mollis Lindl., *Gen. Sp. Orch. Pl.*: 490 (1840). Type: Singapore, *Wallich* s.n. (holotype K).

Terrestrial. *Gymnostoma* ridge forest. Elevation: 700–1000 m. Flowering observed in April.

General distribution: Peninsular Malaysia, Singapore, Sumatra and Borneo.

Collection: Mount Kinabalu, Kota Belud, Melangkap Tomis, along Mount Doa ridge trail, 10 April 1995, *Barkman* TJB 171 (Sabah Parks Herbarium, Kinabalu Park).

OBERONIA Lindl.

27. Oberonia ciliolata Hook.f., *Fl. Brit. Ind.* 6: 181 (1890). Type: Singapore, Krangi, *Ridley* 375 (holotype K).

Epiphyte. Growing with *Miscanthus floridulus* (Graminae). Elevation: 400 m. Flowering and fruiting observed in December.

General distribution: Peninsular Malaysia, Singapore, Thailand, Sumatra, Java and Borneo.

Collection: Mount Kinabalu, Kampung Melangkap Tomis, 13 December 1995, *Lorence Lugas* (PEK) 1489 (K).

PHOLIDOTA Lindl. ex Hook.

28. Pholidota sulcata J.J. Sm. in *Icon. Bogor.* 2: 27, t. 107A (1903). Type: cult. hort. Bogor, *Hallier* s.n. (holotype BO, later dupl. BO, L). Section *Acanthoglossum.*

Epiphyte. Lower montane forest. Elevation: 600–1600 m. Flowering observed in January and August.

General distribution: Borneo.

Additional Collections: Mount Kinabalu, Kampung Lakang, 3 miles from Kampung Nalumad at boundary of Park, 16 Aug. 1996, *Daim Andau* (PEK) 479 (K). Mount Kinabalu, Pinosuk Plateau, cult. Kinabalu Park Mountain Garden, January 1996, *Barkman* TJB 272 (Sabah Parks Herbarium, Kinabalu Park).

SCHOENORCHIS Reinw.

29. Schoenorchis buddleiflora (Schltr. & J.J. Sm.) J.J.Sm. in *Nat. Tijdschr. Ned. Ind.* LXXII: 100 (1912). Type: Sumatra, Padang, *Schlechter* s.n. (holotype BO).

Saccolabium buddleiflorum Schltr. & J.J. Sm. in *Bull. Dep. Agric. Indes Neerl.* XV: 25 (1908).

Epiphyte. Open forest of small trees on ultramafic substrate. Elevation: 1500–2100 m. Flowering observed in December.

General Distribution: Sumatra, Borneo.

Additional Collections: Mount Kinabalu, Marai Parai Spur, 1985, *Argent* s.n., cult. Edinburgh Botanic Garden, flowered 1988, cult. no. C.14844 (E, K); Gurulau Spur, cult. Tenompok orchid garden, *J. & M.S. Clemens* 51057 (BM, K).

SPATHOGLOTTIS Blume

30. Spathoglottis confusa J.J. Sm. in *Bull. Jard. Bot. Buitenzorg*, ser. 3, 12: 122 (1932). Type:

Kalimantan, Sintang, Mount Kelam, *Hallier* 406a (holotype L, isotype BO).

Terrestrial. Primary forest. Elevation: not recorded. Flowering observed in May.

General distribution: Borneo.

Collection: Mount Kinabalu, Kampung Serinsim, Park boundary waterfall, 16 May 1995, *Kinsun Bakia* (PEK) 434 (K).

TAINIA Blume

31. Tainia sp. probably **T. latifolia** (Lindl.) Rchb.f. subsp. **elongata** (J.J. Sm.) H. Turner in *Orch. Monographs* 6: 80 (1992). Type: Java, Tjiawi, *Joseph* s.n. (BO).

Tainia elongata J.J.Sm. in *Bull. Dép. Agric. Indes Néerl.* 43: 18 (1910).

Terrestrial. Primary forest. Elevation: not recorded. Flowering observed in February.

General distribution: Sumatra, Java and Borneo.

Collection: Mount Kinabalu, Ranau District, Bundu Tuhan-Kampung Pahu, 17 February 1994, *Doinis Soibeh* (PEK) 725 (K).

32. Tainia speciosa Blume, *Bijdr.*: 354 (1825). Type: Java, Salak, *Blume* s.n. (holotype L).

Terrestrial. Lower montane forest on ultramafic substrate. Elevation: 1000 m. Flowering observed in May.

General distribution: Peninsular Malaysia, Thailand, Java, Borneo.

Collection: Mount Kinabalu, Kota Marudu, trail leading to summit of Mount Tambuyukon, 28 May 1995, *Barkman* TJB 195 (Sabah Parks Herbarium, Kinabalu Park).

VANILLA Mill.

33. Vanilla havilandii Rolfe in *Kew Bull.*: 236 (1918). Type: Sarawak, Kuching, *Haviland* s.n. (syntype K); Matang, *Ridley* s.n. (syntype K).

Climber. Secondary forest. Elevation: not recorded. Flowering observed in June.

General distribution: Borneo.

Collection: Mount Kinabalu, 3 miles from Kampung Nalumad, 14 June 1996, *Daim Andau* (PEK) 440 (K).

RE-DETERMINATIONS

AGROSTOPHYLLUM Blume

34. Agrostophyllum stipulatum (Griff.) Schltr. in *Bot. Jahrb.* 45, Beibl. 104: 22 (1911). Type: Peninsular Malaysia, Pinang, *Lewis* s.n. (holotype not located; neotype: *Griffith* drawing 1851 selected by Schuiteman).

subsp. **stipulatum**

Collections cited under *A. bicuspidatum* J.J. Sm. (= *A. stipulatum* (Griff) Schltr. subsp. *bicuspidatum* (J.J. Sm.) Schuit.) by Wood, Beaman & Beaman (1993) are probably referable to either subsp. *stipulatum* or *A. elongatum* (Ridl.) Schuit.

BROMHEADIA Lindl.

Four collections cited by Wood, Beaman & Beaman (1993) have been re-determined during studies towards a revision of *Bromheadia* by Kruizinga, van Scheindelen & de Vogel (1997). These are listed below:

35. Bromheadia brevifolia Ridl. in *J. Linn. Soc., Bot.* 32: 340 (1896). Types: Peninsular Malaysia, Hermitage Hill, *Ridley* s.n. (syntype not located); Sarawak, *Haviland* s.n. (lectotype SING, chosen by Kruizinga *et al.*).

Epiphyte. Lower montane forest on ultramafic substrate. Elevation: 1400 m. Flowering recorded throughout the year.

Collection: Mount Kinabalu, Mahandei River Head, *Carr* SFN 27245 (SING). Originally cited under *B. aff. aporoides* Rchb. f. *B. brevifolia* has previously been recorded from Mount Kinabalu.

36. Bromheadia ensifolia J.J. Sm. in *Bull. Jard. Bot. Buitenzorg*, ser. 3, 8: 45 (1926). Type: Sumatra, West coast, Sidjoendjoeng District, Boekit Pakano, *Theunissen* s.n., cult. *Jacobson* no. 1629 (holotype L, isotype BO

Epiphyte. Lower montane forest. Elevation: 1400–1500 m. Flowering recorded in June.

Additional Collections: Mount Kinabalu, Peniguppan, *Carr* SFN 27578 (K, SING); Tenompok, *J. & M.S. Clemens* 28818 (K). Originally cited under *B. scirpoidea* Ridl.

37. Bromheadia truncata Seidenf. in *Opera Bot.* 72: 14, fig. 5 (1983). Type: Thailand, Doi Suthep, *Seidenfaden & Smitinand* GT 2691 (holotype C).

Epiphyte. Lower montane forest. Elevation: 1400 m. Flowering observed from August until February.

Collection: Mount Kinabalu, Gurulau Spur, *Carr* 3176, SFN 27455A (SING). Originally cited under *Bromheadia* indet. *B. truncata* has been previously recorded from Mount Kinabalu.

TAXA NO LONGER KNOWN ONLY FROM MOUNT KINABALU

BULBOPHYLLUM Thouars

Bulbophyllum heldiorum J.J. Verm., *Orchids of Borneo 2*: 143, fig. 46 (1991). Mount Kinabalu, Summit Trail, *Vermeulen & Duistermaat* 547 (holotype L; isotypes K, Sabah Parks Herbarium, Kinabalu Park). Section *Globiceps*.

Collection: Sabah, Tambunan District, Mount Trus Madi, epiphytic in mossy montane forest, 1900 m, 10 March 1995, *Barkman* TJB 152 (Sabah Parks Herbarium, Kinabalu Park).

DENDROCHILUM Blume

Dendrochilum dewindtianum W.W. Sm. in *Notes Roy. Bot. Gard. Edinburgh* VIII: 321 (1915). Types: Sabah, Mount Kinabalu, *Native collector* 68 (holotype E), *Native collector* 99 (paratypes E, K). Section *Platyclinis*.

var. **dewindtianum**

Dendrochilum furfuraceum J.J.Sm. in *Bull. Jard. bot. Buitenzorg*, ser. 3, V: 55 (1922). Type: Sumatra, Sumatera Barat, Brani, 900 m, *Bünnemeijer* 3333 (holotype L).

Examination of the type of the Sumatran *D. furfuraceum* reveals no appreciable differences. The material falls within the range of variation of *D. dewindtianum* var. *dewindtianum* (Pedersen, Wood & Comber 1997).

RECENT SYNONYMY AND NAME CHANGES

ANOECTOCHILUS Blume

Anoectochilus kinabaluensis (Rolfe) J.J. Wood & Ormd. in *Orchid Rev.* 102 (1198): 216 (1994). Types: Mount Kinabalu, Gurulau Spur, 1500–1700 m, *Gibbs* 3997 (syntype BM), 1500–1700 m, *Gibbs* 4003 (syntype BM).

Goodyera kinabaluensis Rolfe in Gibbs in *J. Linn. Soc., Bot.* 42: 159 (1914).

In 1914 R.A. Rolfe described *Goodyera kinabaluensis* based on collections made on Mount Kinabalu by Lillian Gibbs. Examination of syntype material at the Natural History Museum

(BM) in London and recent collections preserved in alcohol at Kew, show this to be an *Anoectochilus* with peloric flowers. The labellum is simple and lacks the characteristic numerous thread-like calli of *Goodyera*. The column has the two ventral wings characteristic of *Anoectochilus*, which are absent in *Goodyera*.

DENDROCHILUM Blume

Dendrochilum corrugatum (Ridl.) J.J. Sm. in *Recl. Trav. bot. néerl.* 1: 65 (1904). Type: Mount Kinabalu, Marai Parai Spur, 1700 m, *Haviland* 1814 (holotype SAR). Section *Eurybrachium*.

Platyclinis corrugata Ridl. in Stapf in *Trans. Linn. Soc. Lond.* 2, IV: 233 (1894).
Acoridium corrugatum (Ridl.) Rolfe in *Orchid Rev.* XII: 220 (1904).
Dendrochilum fimbriatum Ames, *Orchidaceae VI*: 51 (1920). Type: Mount Kinabalu, Marai Parai Spur, 23 November 1915, *J. Clemens* 248 (holotype AMES).

D. corrugatum was, until now, known only from the type, *Haviland* 1814, upon which H.N. Ridley prepared one of his characteristically brief original descriptions. The extant flowers on the type have, unfortunately, suffered damage since Ridley's time. The sepals and petals and much of the labellum are missing, although the column, minus the anther-cap, is intact. Comparison at Kew of *Haviland* 1814, with the type and several other excellent collections of *D. fimbriatum* however, leaves no doubt that they are conspecific. The types of both species were collected from Marai Parai Spur, an area of ultramafic substrate on the western slopes of Mount Kinabalu. Both have unusually long roots for the size of the plant, strongly wrinkled pseudobulbs, similarly textured leaves, identical floral bracts, a similarly shaped denticulate-fimbriate labellum and an identical column with oblong, obtuse stelidia and a distinctive, prominent rostellum.

Dendrochilum dewindtianum W.W. Sm. in *Notes Roy. Bot. Gard. Edinburgh* VIII: 321 (1915). Types: Mount Kinabalu, *Native collector* 68 (holotype E), *Native collector* 99 (paratypes E, K). Section *Platyclinis*.

var. **dewindtianum**

Dendrochilum lobongense Ames, *Orchidaceae VI*: 59 (1920). Types: Mount Kinabalu, Lubang (Lobong), *J. Clemens* 116 (holotype AMES).

D. dewindtianum is a variable species abundant above 2600 m on Mount Kinabalu, particularly in forest and scrub developed on ultramafic substrate. Leaf and flower dimensions and labellum shape vary greatly throughout its range. Examination of the type of *D. lobongense* shows it to fall within this pattern of variation.

COELOGYNE Lindl.

Coelogyne genuflexa Ames & C. Schweinf., *Orchidaceae VI*: 28 (1920). Type: Mount Kinabalu, Marai Parai Spur, *J. Clemens* 251 (holotype AMES). Section *Tomentosae*.

Coelogyne reflexa J.J. Wood & C.L. Chan in *Lindleyana* 5 (2): 87, fig. 5 (1990). Type: Sabah, Mount Alab, *de Vogel* 8666 (holotype K; isotype L).

Recent comparisons made by C. L. Chan of the recently described *C. reflexa* with the type of *C. genuflexa* show the two taxa to be conspecific.

PHOLIDOTA Lindl. ex Hook.

Pholidota sigmatochilus J.J. Sm. in *Blumea* 5: 299 (1943). Type: Mount Kinabalu, below Paka-paka, *Gibbs* 4260 (holotype BM). Section *Acanthoglossum*.

Sigmatochilus kinabaluensis Rolfe in Gibbs in *J. Linn. Soc.*, Bot. 42: 155, plate 3 (1914). *Chelonistele kinabaluensis* (Rolfe) de Vogel in *Blumea* 30: 203 (1984).

Re-instatement of *Pholidota sigmatochilus* was undertaken by Barkman & Wood (1997). Study of plants in the field and herbarium revealed that *P. sigmatochilus* shares few morphological features with *Chelonistele* and is more appropriately placed within *Pholidota*. Within *Pholidota*, this taxon is closely allied to *P. clemensii* Ames and belongs in section *Acanthoglossum*.

ERRATA

BULBOPHYLLUM Thouars

Bulbophyllum ionophyllum J.J. Verm., *Orchids of Borneo* 2: 65, fig. 18 (1991). Type: Sabah, *Chan* s.n. (holotype L). Section *Aphanobulbon*.

Bulbophyllum sopoetanense sensu Wood, Beaman & Beaman, *Plants of Mount Kinabalu 2, Orchids*, plate 15B (1993), non J.J. Sm.

The plant figured by Wood *et al.* (1993) was incorrectly referred to *B. sopoetanense* J.J.Sm.

Bulbophyllum sp. Section **Sestochilus**

The plant referred to *B. microglossum* Ridl. by Wood *et al.* (plate 13B) is, according to L.A. Garay (pers. comm.), an undescribed species.

DENDROCHILUM Blume

Dendrochilum pterogyne *Carr* in *Gard. Bull. Straits Settlem.* 8: 236 (1935). Type: Mount Kinabalu, Paka-Paka, *Carr* 3541, SFN 27597 (holotype SING; isotypes AMES, K). Section *Eurybrachium*.

Dendrochilum alatum sensu Wood, Beaman & Beaman, *Plants of Mount Kinabalu 2, Orchids*, plate 40 C & D (1993), non Ames.

The plant figured by Wood *et al.* (1993) was incorrectly referred to *D. alatum* Ames.

Index to numbered Bornean collections

(type collections are indicated in **bold**; species numbers appear in brackets; AL = *Anthony Lamb*; C. = *Carr*; PEK = Projek Ethobotani Kinabalu; SAN = Sandakan; SNP = Sabah National Parks; SFN = Singapore Forest Number; TJB = *Todd J. Barkman*)

Aban: SAN 76693 (4).
Andau, Daim (PEK): 35 (15); 440 (32); 479 (28); 758 (20); 937 (10).
Argent s.n. (29).
Bacon: 187 (12a).
Bakia, Kinsun (PEK): 434 (29).
Barkman: TJB 16 (13); TJB 18 (13); **TJB 27** (19); TJB 60 (8); TJB 152 (37); TJB 171 (26); TJB 183 (13); TJB 187 (25); TJB 194 (12b); TJB 195 (31); **TJB 198** (13); TJB 272 (28); TJB 276 (21).
Carr: C. 3176, SFN 27455A (36); C.3470 (5); **C. 3675, SFN 28004** (12b); SFN 27245 (34); SFN 27455 p.p (1 & 3); SFN 27564 (11); SFN 27578 (35); **SFN 27902** (4).
Clemens, J. & M.S.: 26774 (17); 28818 (35); 29821 (4); 30471 (12a); 30826 (12a); 32220 (12a); 34107 (7); 40134 (12a); 50278 (12a); 50322 (12a); 51057 (29).
Collector unknown: SFN 36563 (12a).
Dransfield, J.: **5129** (23).
Giles: **998** (5).
Hallier: **406a** (29).
Hansen: **499** (21).
Jongejan: **1956** (6).
Lamb: **AL 569/86** (14); AL 743/87 (7); AL 820/87 (14); AL 1294/91 (6); SAN 92317 (14).
Lamb & Phillips in *Lamb*: AL 161/83 (11).
Leopold et al. **SAN 71909** (3).
Lugas, Lorence (PEK): 1489 (27); 1716 (24); 2127 (18); 2592 (16).
Phillipps: SNP 2393 (14).
Rumutom, Matamin (PEK): 251 (10).
Soibeh, Doinis (PEK): 205 (19); 725 (30).
Sumbin & Gunsalam: **SNP 5134** (11).
Tadong, Lomudin (PEK): 540 (22).

Vermeulen: **467** (7); 613 (7); 651 (14); **s.n., Leiden cult. no. 26690** (2).
Vermeulen & Chan: 398 (14).
Vermeulen & Duistermaat: **547** (37).
Vermeulen, van Welzen & Lamb: 1329 (7); 1330 (6).
de Vogel: 8661 (12a); **s.n., Leiden cult. no. 913892** (1).

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